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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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KEUSEY, TUTUNJIAN & BITETTO, P.C.
14 VANDERVENTER AVENUE, SUITE 128
PORT WASHINGTON, NY 11050

EXAMINER	
CHANG, AUDREY Y	
ART UNIT	**PAPER NUMBER**
2872	

DATE MAILED: 10/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/817,592	HARTKOP ET AL.	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-81* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-81* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of species C in the reply filed on July 29, 2005 is acknowledged. The traversal is on the ground(s) that all of the species are parts of the same invention. The examiner agrees and will withdraw the restriction.

2. Claims 1-81 remain pending in this application.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 1-81 are rejected under 35 U.S.C. 112, first paragraph,** as **failing** to comply with the **enablement** requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification and the claims **fails** to teach how could a three-dimensional display device and method for manufacturing solid state three dimensional device be achieved by simply having a display screen and an aperture plate. Three-dimensional display of image simply **cannot** be created by such arrangement *only*. Three dimensional display is achieved by **firstly** having stereo-related image displayed on the display screen and then with *certain optics* to ensure the left eye perspective of the image goes to the left eye and the right eye perspective of the image goes to right eye of an observer respectively. The claims simply **fail** to disclose such. The three dimensional display simply will **NOT** provide "multiple different perspectives viewable from multiple different user viewing angles" as recited in the claims and

simply will **NOT** be able to "exhibit both horizontal and vertical parallax" as recited in the claims. Certain essential elements and conditions are needed to achieve such features that are not in the claims to make the claims enabling.

Also the specification fails to teach how could a "solid state three-dimensional *device*" can be manufactured by having substrate and dynamic parallax barrier. A solid state three-dimensional *device* is DIFFERENT from a solid state three-dimensional *display* device.

The specification also fails to teach how could the frame rate of the display device is capable of producing "at least 8 viewing angles" as recited in claim 11. A frame rate of the display device, **only controls** rate of image frame being displayed but it does not control the *what* and *where* the images are being displayed . Also the viewing angles are related to the aperture location and the image location, not on frame rate.

The specification and the claims also fail to teach how could the horizontal parallax having a "viewable operating range up to 180 degrees" and vertical parallax having a "viewable operating range up to 180 degrees" as recited in the various claims. The parallax of angular viewing the images for achieving stereoscopic image display cannot exceed the angle viewing difference between two eyes of the observer which is a very narrow angle. It is not clear the parallax needed for achieving stereoscopic is capable being viewed at 180 degrees. Such angle range certainly will not be able to achieve stereoscopic image display and viewing.

Claim 81 recites the phrase "a hybrid screen" but the specification fails how a hybrid screen is formed.

The claims are full of errors that make the device a non-enabling device.

Claim Objections

5. Claims 1-81 are objected to because of the following informalities:

The claims at this juncture are full of errors, confusions and indefiniteness. The examiner can only point out a few. It is applicant's responsibility to clarify **ALL** of the discrepancies of the claims to make the claims in complied with the requirements of 35 USC 112, first and second paragraphs.

(1). The phrase "multiple different perspectives viewable from multiple different user viewing angles" recited in claim 1 and other claims are confusing and indefinite since it is not clear what are these "perspectives". And where do these "multiple different user viewing angles" come from? These angles have to be defined by the structures of the device however no such teachings are disclosed.

(2). The phrase "control system controlling *sequencing* of said display screen and said aperture plate to produce three-dimensional images" as recited in claim 2 is confusing and wrong. **Firstly**, there is no "sequencing" of the display screen that can be controlled. **Secondly**, what exactly are the "*sequencing*" is being controlled here? **Thirdly**, control "sequencing" **WILL NOT** provide three-dimensional images. The image frame for certain perspectives and locations intended for viewing can be sequentially displayed on the screen and location of the apertures on the aperture plate can be controlled in synchronization with the image frame displayed to achieved three dimensional viewing.

(3). The aperture plate may have apertures on the plates but will not "produce" slit apertures.

(4). **Claim 9 is wrong**. If the aperture plate has number of apertures that *equals* the number of the pixels then the aperture plate essentially has no function, since all of the image light from all of the pixels will just pass through the aperture plate and no three-dimensional display will be achieved.

(5). The phrase "i.e., 8 different perspectives" recited in claim 11 is indefinite since it is not clear if the phrase after "i.e." is or is not part of the claims.

(6). The phrase "a solid state scan type" and "a solid state type" recited in various claims are confusing since it is not clear what are these types.

(7). The phrase "said vertical view angle" recited in various claims is confusing and indefinite for lacking proper antecedent basis from their respective based claim. The phrase "said solid state scan type" recited in **claim 39** is confusing and indefinite since it lacks proper antecedent basis.

(8). The phrase "a number of vertical viewing angles is less than a number viewing angles" recited in claim 41 is completely confusing.

(9). The phrase "a solid state three dimensional display device" recited in various claims is confusing since it is not clear what is this "solid state" referred to. It is untreatable all of the elements in the claims are of "solid state" not "liquid state". Is this what the phrase meant?

(10). The phrase "a hybrid screen" recited in claim 81 is confusing and indefinite since it is not clear what does it means by the term "hybrid"?

The claims are full of errors and for at least the reasons stated above, the scopes of the claims are not clearly defined. Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Harrold et al (PN. 5,969,850).

The claims fail to define an enabling device and the scopes are not definite, they can therefore only be examined in the broadest interpretation.

Harrold et al teaches a *three dimensional image display device* that is comprised of a *display device* having a screen (Fast SLM, 1 Figures 31 and 34), wherein the display device is a *liquid crystal*

display device having pixels and pixel width and a *dynamic parallax barrier* (LCD2) serves as the *aperture plate* disposed in front of the display device for allowing different pairs of spatially multiplexed 2D images displayed on the display device are viewed at *different fields* or different *viewing angles*, (please see Figures 31 and 34) such that multiple stereoscopic or three dimensional images can be viewed at different viewing fields, (please see column 12-13).

Harrold et al teaches that *a gap* such a *solid substrate* is interposed between the display device (1) and the dynamical parallax barrier (2). This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the gap separates the display screen and the parallax barrier or the aperture plate is in the range of 0.1 cm to 5 cm. However this value is either inherently met by the disclosure since this value is essential for achieving the three-dimensional image viewing with respect to the size of the display and aperture plate or it is an obvious modification to one skilled in the art for making the display device suitable for use in system having elements with specific size in the range. It has been held that a mere change in size of a device is generally recognized as being within the general skill in the art. In re Rose, 105, USPQ 237 (CCPA 1955).

Harrold et al teaches that the displaying of the pairs of spatially multiplexed 2D images in different viewing field are synchronize with the dynamical parallax barrier to ensure the images are viewed at different angle of view.

With regard to claim 3, although this reference does not teach that the gap is an air gap, such modification is considered to be obvious to one skilled in the art for reducing the material needed for manufacturing the device.

With regard to features concerning the slit apertures of the aperture plate, Harrold et al teaches that the dynamical parallax barrier has *vertical* slits apertures, (please see Figures 2 and 3). The slit width is compatible with the width of the pixel of the display device, since the width of the slits is essential for making the device capable of displaying three dimensional images. The number of the apertures on the

dynamical parallax barrier can be smaller than or the same as the number of the pixels of the display device, (please see Figures 31 and 34).

With regard to the features concerning the display device and the dynamical parallax barrier, **Harrold** et al teaches that both the display device and dynamical parallax barrier can be made of *liquid crystal display device* or *ferroelectric liquid crystal display devices*, (FLC) (please see column 12, lines 26-30). Harrold et al teaches that the display device comprises a fast modulator such as *fast FLC device*, although this reference does not teach explicitly about the frame rate of the image displayed on the display device it is known in the art that a FLC device has a typical rate of 10Khz or 10, 000 frames per second. The number of the viewing angles is considered to be obvious modification to one skilled in the art to make the display device suitable for different applications requirements. The display device shown in Figures 31 and 34 is of rear projection type of display device.

With regard to claims 17 and 18, the dynamical parallax barrier comprises the ferroelectric liquid crystal display device serves as the solid state scan type.

8. Claims 21-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Aritake et al in view of the patent issued to Harrold et al (PN. 5,969,850).

The claims fail to define an enabling device and the scopes are not definite, they can therefore only be examined in the broadest interpretation.

Aritake et al teaches a *stereoscopic image display device* that is comprised of a *display device* (302 or 602, Figures 32-35, 43, 58 and 62) and a *parallel scanning part* (303) serves the *aperture plate* having a plurality of apertures, (please see Figure 43B), that is disposed in front of the display device. Aritake teaches that the parallel scanning part may include *liquid crystal shutter* (341) having the *slit apertures* arranged in *matrix format* to allow images provide both *vertical and horizontal parallax*, (please see Figures 43B, column 22 line 67 to column 23, line 9).

It is implicitly true that *a distance separation* between the display device and the aperture plate is provided. This reference has met all the limitations of the claims with the exception that it does not teach *explicitly* that the display device having pixels and a pixel width. However such feature is implicitly included since **Aritake** et al teaches that the image data displayed on the display device can be pixilated to represent different perspective of the object, (please see Figure 6) and the pixilated image is required to cooperate with the scanning part to provide different view of the stereoscopic image at multiple viewing angles. Furthermore, display device having pixels for displaying image in the pixilated format is very well known in the art. **Harrold** et al in the same field of endeavor teaches to use a fast spatial light modulator such as a *ferroelectric liquid crystal display device* for displaying multiple view of stereoscopic image, (please see Figures 31-34). It would then have been obvious to one skilled in the art to apply the teachings of **Harrold** et al to use a ferroelectric liquid crystal display device as the *fast* display device required by *Aritake* et al to efficiently display the image data for creating multiple stereoscopic image viewable from different viewing angles. Harrold et al teaches that the aperture size is not smaller than the pixel size. With regard to claims 76-77, the display device of Harrold et al shown in Figures 31 and 34 is of rear projection type of display device and it includes a display screen.

With regard to claims 23-25, 42-43, 53-54, 57-58 and 76, Aritake et al teaches that air gap may be included in the separation between the display device and the aperture plate or the scanning part but it does not teach explicitly that the separation may also be formed of a solid substrate. **Harrold** et al teaches that a *solid substrate* may be used to interpose between the display device (1) and the dynamical parallax barrier (2, Figure 34) to keep the two in proper structural relationship. It would then have been obvious to one skilled in the art to apply the teachings of **Harrold** et al to make a solid substrate as the separation for properly separating the two and to ensure the proper distance be set between the two to ensure good image quality. These references however do not teach explicitly that the gap separates the display screen and the parallax barrier or the aperture plate is in the range of 0.1 cm to 5 cm or to 10 cm.

However this value is either inherently met by the disclosure since this value is essential for achieving the three-dimensional image viewing with respect to the size of the display and aperture plate or it is an obvious modification to one skilled in the art for making the display device suitable for use in system having elements with specific size compatible in the range. It has been held that a mere change in size of a device is generally recognized as being within the general skill in the art. In re Rose, 105, USPQ 237 (CCPA 1955).

With regard to claims 55 and 56, Harrold et al teaches that the substrate separation is of uniform thickness and one skilled in the art will be able to make the substrate bonded with no interference to the refractive index of the substrate so that unwanted reflection of the light will not occur at the interface.

With regard to the features concerning *horizontal view angle*, the *vertical view angle*, the *horizontal parallax viewable range* and *vertical parallax viewable range*, it is implicitly true that the view angles for the horizontal is within the angle ranges claimed, (please see the Figures shown in Aritake et al and Harrold et al) and the view angle for the vertical is also within the range claimed since Aritake et al specifically teaches to include a vertical visible range expansion element included (please see Figure 24) in the scanning part or the aperture plate. The features concerning the horizontal and vertical parallax viewable ranges, are not clearly defined and they cannot be examined with details. However it is implicitly true that a "parallax" certainly can be viewed in the ranges claimed.

With regard to claims 31-38, 45-48, 53, 57, 59-63, and 69-71, **Aritake** et al teaches that the aperture plate or the scanning part may include liquid crystal shutter (Figure 43B). **Harrold** et al teaches that both the display device and the aperture plate or the dynamical parallax barrier may be made of liquid crystal device or fast switching type ferroelectric liquid crystal display device, (please see column 12, lines 25-30). Although these references do not teach explicitly about the frame rate of the image displayed on the display device it is known in the art that a FLC device has a typical rate of 10Khz or 10,

000 frames per second. The display device shown taught by Aritake et al and Harrold et al as in Figures 31 and 34 of is of rear projection type of display device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Audrey Y. Chang, Ph.D.
Primary Examiner
Art Unit 2872

A. Chang, Ph.D.